Complete Summary

GUIDELINE TITLE

Chemotherapy and biotherapy guidelines and recommendations for practice.

BIBLIOGRAPHIC SOURCE(S)

Oncology Nursing Society (ONS). Chemotherapy and biotherapy guidelines and recommendations for practice. 2nd ed. Pittsburgh (PA): Oncology Nursing Society (ONS); 2005. 246 p. [886 references]

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Oncology Nursing Society (ONS). Chemotherapy and biotherapy: guidelines and recommendations for practice. Pittsburgh (PA): Oncology Nursing Society (ONS); 2001. 226 p.

** REGULATORY ALERT **

FDA WARNING/REGULATORY ALERT

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

On August 31, 2005, Genentech and the U.S. Food and Drug Administration (FDA) notified healthcare professionals of updated cardiotoxicity information related to the use of Herceptin (trastuzumab), obtained from the National Surgical Adjuvant Breast and Bowel Project (NSABP) study (B-31), a randomized, Phase III trial that was conducted in 2043 women with operable, HER2 overexpressing breast cancer (IHC 3+ or FISH+). This study demonstrated a significant increase in cardiotoxicity in patients who were randomized to the Herceptin-containing arm as compared to patients who received chemotherapy alone. See the FDA Web site for more information.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Cancer

GUIDELINE CATEGORY

Evaluation
Management
Treatment

CLINICAL SPECIALTY

Nursing
Oncology
Radiation Oncology

INTENDED USERS

Advanced Practice Nurses
Nurses

GUIDELINE OBJECTIVE(S)

To provide recommendations for the administration of chemotherapy and biotherapy

TARGET POPULATION

- Adults or children with cancer receiving chemotherapy
- Nurses administering chemotherapeutic agents and/or biotherapy
- Adults (unless otherwise specified) with cancer receiving biotherapy

INTERVENTIONS AND PRACTICES CONSIDERED

1. Therapeutic use of chemotherapeutic and biotherapeutic agents, including proper storage, labeling, handling, and administration.

   Chemotherapeutic agents including:

   - Antimetabolites
   - Vinca alkaloid

- Epipodophyllotoxins
- Taxanes
- Camptothecins
- Miscellaneous cytotoxic agents
- Alkylating agents
- Antitumor antibiotics
- Hormonal therapy
- Nitrosoureas

Biologic agents including:

- Anticoagulant (Lepirudin [Refludan])
- Enzyme (Rasburicase [Elitek])
- HER1/EGFR tyrosine kinase inhibitor: (Erlotinib [Tarceva])
- Granulocyte macrophage colony-stimulating factors
- Hematopoietic growth factors
- Interferons
- Interleukins
- Monoclonal antibodies

2. Appropriate selection and use of antiemetic agents to control chemotherapy-induced nausea and vomiting
    - Serotonin antagonists (ondansetron, granisetron, dolasetron, palonosetron)
    - Dopamine antagonists (metoclopramide, prochlorperazine, haloperidol)
    - NK-1 antagonist (Aprepitant)
    - Cannabinoid (dronabinol)
    - Corticosteroid (dexamethasone)
    - Anxiolytic (lorazepam)

3. Appropriate selection and use of antidiarrheal agents to control chemotherapy-induced diarrhea
    - Antimotility agents
    - Absorbent agents
    - Antisecretory agents
    - Anticholinergics

4. Patient preparation (education and informed consent) and pre-treatment assessment
5. Assessment of patient during treatment and post-treatment for adverse effects, complications, and response to treatment
6. Nursing management of general side effects of therapy, adverse reactions, or toxicities
7. Patient and family education

MAJOR OUTCOMES CONSIDERED

Not stated

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed literature searches using Medline, CINAHL (Cumulative Index to Nursing and Allied Health), and Index Medicus. In addition, evidence was obtained through review of the Cochrane Library, Agency for Healthcare Research and Quality, and the National Comprehensive Cancer Network.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Hierarachy of the levels of evidence range from strongest to weakest with the strongest level being meta-analysis of multiple controlled clinical trials and weakest being opinions.

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The guideline document was reviewed by field reviewers.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Cancer Therapy Goals and Response

A. Goals of cancer therapy (See the original guideline document for full details)
B. Factors affecting response to treatment (See the original guideline document for full details)
C. Measuring response
    1. Measuring tumor response
        a. A tumor is assessed through surgical examination, physical examination, imaging studies, and/or serum tumor markers at the time of diagnosis. Response to treatment administered is determined through comparative measurements of this information. Those tests that provided information upon which to base treatment decisions are repeated.
        b. Tumor response has historically been classified according to the following categories (Perry, Anderson, & Donehower, 2000).
            1. Complete response (CR): Absence of all signs and symptoms of cancer for at least one month using objective criteria (e.g., quantitative bidimensional tumor measurement)
            2. Partial response (PR): At least a 50% reduction of measurable tumor mass for one month without development of new tumors
            3. Stable disease (SD): A reduction in tumor mass of less than 50% or less than a 25% increase in tumor growth
            4. Progressive disease (PD): Growth of 25% or more or development of new tumors
            5. Relapse: After CR, a new tumor appears or the original tumor reappears. Or, with PR, a new tumor appears or the original tumor increases in size.

        c. Response Evaluation Criteria in Solid Tumors (RECIST) guidelines: The new guidelines were developed in 1999 by an international task force. These guidelines were presented to scientists and then submitted to National Cancer Institute (NCI) for official publication (Therasse et al., 2000). Although not widely used at present, this system continues to gain favor and should facilitate communication between researchers and clinicians.

1. The World Health Organization (WHO) (Therasse et al., 2000) recognizes that new technologies (e.g., computed tomography [CT] scans, magnetic resonance imaging [MRI]) have led to confusion regarding three dimensional measurement of disease. As a result, the reported response criteria vary among research groups.
2. RECIST guidelines include the following (Therasse et al., 2000).
    a. Response to a clinical trial is used to decide if an agent or regimen demonstrated results that are promising enough to warrant further testing (prospective end point).
    b. In further trials, tumor response provides an estimate of benefit for a specific group of patients.
    c. Response to treatment guides the clinician and patient about continuing with the same therapy.
    d. If distinctions are not explicit, tumor response can be missed, ignored, or inappropriately evaluated. This may cause incorrect results or conclusions.
    e. At baseline, tumors must be measurable in at least one dimension (using metrics) by calipers or a ruler. Baseline measurements must be within four weeks of initiating therapy. (Nonmeasurable lesions include bone lesions, ascites, pleural or pericardial effusions, leptomeningeal disease, and inflammatory breast cancer.)
    f. The same method and technique used at baseline must be used to evaluate response for reporting and follow-up.
    g. If the primary end point is response to treatment, the patient must have at least one measurable lesion at baseline. If only one measurable lesion is present, it must be confirmed by cytology or histology.
    h. Measurable lesions, up to 5 per organ or 10 in total, are identified as "target" lesions. Those selected are the longest in diameter and also suitable for follow-up measurement. The sum of the longest diameter for each lesion is calculated and reported as the baseline sum longest diameter. This sum is used as the reference to compare response. All other non-target lesions are measured and recorded if possible. Their presence or absence can be noted for follow-up but is not included in the response evaluation.
3. Using RECIST criteria
    a. CR is the disappearance of all target lesions.
    b. PR is a 30% reduction in the sum of the longest diameter of target lesions as compared to the baseline.

c. PD is a 20% increase in the longest diameter compared to the smallest sum recorded since treatment was initiated.
d. Follow-up should be protocol-specified. Every other cycle (6-8 weeks) is reasonable for follow-up. Patients who discontinue therapy because of deterioration of their health condition without evidence of PD are identified as "symptomatically deteriorated." At the conclusion of treatment, follow-up will depend upon the goal of the study. If time is the primary end point of the study, measurements must be compared to the baseline. The duration of overall response is measured from when the measurement criteria were met for CR or PR until the first date a recurrence or PD was measured. The duration of stable disease is the time from initiation of therapy until the criteria are met for PD.

4. Reporting using RECIST results: All patients in the study must be assessed at the end of the study. Patients are assigned to one of the following categories.
    a. CR
    b. PR
    c. Stable disease
    d. PD
    e. Early death from disease
    f. Early death from toxicity

2. Measuring patient response
    a. Response according to performance status scales. After tumor type, patient activity level or performance status is the most important factor to consider when determining appropriate treatment (Ellison & Chevlen, 2002). See Table 3 in the original guideline document, which compares three different performance status scales.
        1. Eastern Cooperative Oncology Group (ECOG) and Zubrod scales: Evaluate adult performance on 0-5 scales; a higher score indicates poorer performance (Oken et al., 1982).
        2. Karnofsky Performance Status scale: Evaluates adult performance in terms of percentage; a lower score indicates poorer performance (Karnofsky & Burchenal, 1949).
        3. Lansky: Evaluates the performance of children ages 10 and younger (Manne et al., 1996)
    b. Subjective patient response: Evaluation is based on the patient's perception of changes in symptoms, activity level, quality of life, and other factors. These factors may reflect the effect of treatment even if objective parameters do not demonstrate change (Ellison & Chevlen, 2002).

Principles of Chemotherapy -- (See the original guideline document for full details)

Principles of Biotherapy -- (See the original guideline document for full details)

Fundamentals of Administration

A. Safe handling: Many drugs used in the treatment of cancer are considered to be hazardous to healthcare workers. The term hazardous refers to drugs that require special handling because of potential health risks. These risks are a result of the inherent toxicities of the drugs ("ASHP technical assistance bulletin," 1990; National Institute for Occupational Safety and Health [NIOSH], 2004). According to the Occupational Safety and Health Administration (OSHA, 1995), safe levels of occupational exposure to hazardous agents cannot be determined, and no reliable method of monitoring exposure exists. Therefore, it is imperative that those who work with hazardous drugs adhere to practices designed to minimize occupational exposure.
    1. Definition of hazardous drugs: - (See the original guideline document for full details)
    2. Potential occupational health risks of hazardous drugs - (See the original guideline document for full details)
    3. Potential occupational health risks associated with biotherapy agents - (See the original guideline document for full details)
    4. Potential routes of exposure to hazardous drugs - (See the original guideline document for full details)
    5. Guidelines regarding personal protective equipment (PPE)
        a. Types of apparel
            1. Gloves: Wear disposable gloves that are powder-free and have been tested for use with hazardous drugs. Inspect gloves for physical defects before use. Latex gloves provide protection but should be used with caution because of the risk of latex sensitivity. Gloves made of other materials, such as nitrile (Singleton & Connor, 1999), polyurethane, or neoprene, provide protection (Connor, 1999). Double gloves are recommended for all handling activities (NIOSH, 2004). Change gloves immediately after each use; if a tear, puncture, or drug spill occurs; or after 30 minutes of wear ("ASHP technical assistance bulletin," 1990; NIOSH, 2004).
            2. Gowns: Wear a disposable, lint-free gown made of a low-permeability fabric, such as polyethylene-coated materials (Connor, 1993; Harrison & Kloos, 1999). The gown should have a solid front, long sleeves, tight cuffs, and a back closure. Inner glove cuffs should be worn under the gown cuffs; outer glove cuffs should extend over the gown cuffs. Discard the gown if it is visibly contaminated, before leaving drug preparation areas, and after handling hazardous drugs. Gowns should not be re-used (NIOSH, 2004).

3. Respirators: Wear a NIOSH-approved respirator mask (such as a nonpowered, air-purifying, particulate-filter respirator) when cleaning hazardous drug spills. Consult the material safety data sheet (MSDS) for the respirator appropriate to the situation (NIOSH, 1996). Surgical masks do not provide respiratory protection.
4. Eye and face protection: Wear a face shield whenever there is a possibility of splashing.

b. Situations requiring PPE: Wear PPE whenever there is a risk of hazardous drugs being released into the environment, such as in the following situations (NIOSH, 2004).
    1. Introducing or withdrawing needles from vials
    2. Transferring drugs using needles or syringes
    3. Opening ampules
    4. Expelling air from a drug-filled syringe
    5. Administering hazardous drugs by any route
    6. Spiking intravenous (IV) bags and changing IV tubing
    7. Priming IV tubing
    8. Handling leakage from tubing, syringe, and connection sites
    9. Disposing of hazardous drugs and items contaminated by hazardous drugs
    10. Handling the body fluids of a patient who received hazardous agents in the past 48 hours
    11. Cleaning hazardous drug spills

6. Storage and labeling of chemotherapeutic agents
    a. On the clinical unit
        1. Store chemotherapy drug containers in a location that permits appropriate temperature and safety regulation.
        2. Label all drug containers to indicate the hazardous nature of their contents (OSHA, 1995).
        3. Have access to instructions (e.g., MSDS) regarding what to do in the event of accidental exposure.
        4. Check hazardous drug containers before taking them from the storage area to ensure that the packaging is intact and to detect any breakage.
    b. In the home (Polovich, 2003) (see Appendix 3 in the original guideline document)
        1. Keep all hazardous drugs out of the reach of children and pets.
        2. Store drugs in containers that provide adequate protection from puncture or breakage.
        3. Label containers to indicate the hazardous nature of their contents.
        4. Provide instructions listing proper procedure for handling a damaged container.
        5. Store hazardous drugs in an area free of moisture and temperature extremes.
        6. Provide spill kits and instructions for their use.

7. Give verbal and written instructions about handling and storing hazardous drugs and hazardous drug waste.

7. Safe handling while mixing hazardous drugs: Maintain sterile technique during the preparation of parenteral drugs.
    a. Chemotherapeutic drugs
        1. Prepare cytotoxic drugs, including oral drugs that must be compounded or crushed, in a biological safety cabinet (BSC) ("ASHP technical assistance bulletin," 1990; NIOSH, 2004). The BSC should
            a. Provide vertical laminar airflow. Vertical airflow carries contaminated air away from the BSC operator and out of the environment.
            b. Eliminate exhaust through a high efficiency particulate air (HEPA) filter. Ideally, a BSC should be vented to the outside (NIOSH, 2004).
            c. Have a blower that operates continuously ("ASHP technical assistance bulletin," 1990).
            d. Be located in a low-traffic area to reduce interference with airflow.
            e. Be used by individuals trained to employ techniques that reduce interference with airflow.
            f. Be serviced according to the manufacturer's recommendations.
            g. Be recertified every six months ("ASHP technical assistance bulletin," 1990).
        2. Wash hands before donning PPE.
        3. Wear appropriate PPE.
        4. If desired, place a sterile, plastic-backed absorbent pad on the work surface. Such pads may interfere with airflow in the BSC (Minoia et al., 1998).
        5. Use safe technique when opening ampules ("ASHP technical assistance bulletin," 1990).
            a. Clear fluid from the ampule neck.
            b. Tilt the ampule away from yourself.
            c. Wrap gauze or an alcohol pad around the neck of the ampule.
            d. Break the ampule in the direction away from yourself.
            e. Use a filtered needle to withdraw fluid.
        6. When reconstituting drugs packaged in vials, avoid pressure buildup, which can result in the release of drug aerosols. Use a closed-system device (e.g., PhaSeal® [Baxa Corp., Englewood, CO]) if available (NIOSH, 2004).
        7. Use tubing and syringes with Luer lock fittings.
        8. Avoid overfilling syringes. A syringe that is too full may separate from the plunger end (OSHA, 1995).
        9. Prime all tubing with fluid that does not contain the drug before adding cytotoxic drugs, preferably in a BSC ("ASHP technical assistance bulletin," 1990; OSHA, 1995) or use a closed-system device to minimize the

risk of exposure (Connor et al., 2002; Wick et al., 2003).
10. Place a label on each container that says "Cytotoxic Drug" or a similar warning.
11. Wipe the outside of the container with moist gauze before placing it in a sealable bag for transport.
12. Dispose of all material that has come into contact with a cytotoxic drug by placing the material into a waste container designated for cytotoxic waste.
13. Remove and discard outer gloves and gown. Then remove inner gloves.
14. Wash hands before leaving the work area.

b. Safe handling while mixing biotherapy drugs
    1. Use safe handling precautions for biotherapy agents that are considered hazardous (e.g., interferon) (NIOSH, 2004).
    2. Wear gloves when mixing biotherapy agents that are irritating to skin (e.g., rituximab [Genentech, Inc., 2000]).
    3. A nuclear pharmacist prepares radiolabeled monoclonal antibodies for infusion. Note: Federal and state laws require that radiation-safety warning signs designate the areas in which radioisotopes are stored or used (Bruner, Haas, & Gosselin-Acomb, 2005).

8. Transporting chemotherapeutic drugs (OSHA, 1995)
    a. Transport syringes containing hazardous drugs in a sealed container, with the Luer lock end of the syringe capped. Do not transport syringes with needles in place.
    b. Select a transport receptacle that can contain spillage if dropped (e.g., a leakproof, sealable bag) and additional impervious packing material as necessary to avoid damage during transport.
    c. Label the outermost receptacle to indicate that its contents are hazardous.
    d. Ensure that whoever will be transporting the drugs has a spill kit and knows how to use it.

9. Safe handling considerations during administration of hazardous drugs ("ASHP technical assistance bulletin," 1990; OSHA, 1995)
    a. Always wear PPE.
    b. Work below eye level.
    c. Ensure that a spill kit and hazardous waste container are available.
    d. Use a closed-system device (NIOSH, 2004), or place a disposable, absorbent, plastic-backed pad underneath the work area to absorb droplets of the drug that may spill.
    e. Use a closed-system device, or place a gauze pad under the syringe at injection ports to catch droplets during administration.
    f. Use needles, syringes, and tubing with Luer lock connectors.

g. If priming occurs at the administration site, prime IV tubing with a fluid that does not contain the drug or by using the backflow method.
h. After drug administration, remove the IV bag or bottle with the tubing attached (NIOSH, 2004; Polovich, 2003). Do not remove the spike from IV containers or reuse tubing.
i. Use detergent and water to wash surfaces that come into contact with hazardous drugs (Polovich, 2003).
j. Discard all contaminated material and PPE in a hazardous waste container.

10. Safety precautions are necessary to protect healthcare workers from exposures while caring for patients receiving some types of radiation therapy. Radiation protection standards and regulations are determined by the U.S. Nuclear Regulatory Commission (NRC), the Food and Drug Administration (FDA) (radiopharmaceuticals), and state radiation regulatory agencies. The next section provides information about radiation precautions. Principles of radiation precautions:
    a. Occupational radiation exposure should be kept as low as reasonably achievable (ALARA). This requires close collaboration between the healthcare team and the radiation safety officer (RSO). Three factors help to provide protection (Dunne-Daly, 1999).
        1. Time: The amount of time spent near the radioactive source. The amount of exposure received is directly proportional to the amount of time spent near the source. (After a patient receives radioimmunotherapy (RIT), the patient is the radioactive source.)
        2. Distance: The amount of space between a point and the radioactive source. As the distance from the radioactive source increases, its radiation exposure decreases.
        3. Shielding: A protective shield placed between the radioactive source (usually the patient) and what is to be protected (known as the point). The type of shielding used depends on the type of radiation.
    b. Radiation monitoring devices are used to monitor occupational exposure.
        1. Monitoring of personnel: Personnel monitoring is required by law regardless of whether the patient is treated as an inpatient or outpatient. The film badge is the most widely used monitoring device. Each person caring for a patient receiving radiation should be assigned a film badge that is only worn within the work environment, is changed according to institutional guidelines, and is not shared with anyone else (Bruner, Haas, & Gosselin-Acomb, 2005). A dosimeter is another monitoring device. It can be a personal device or one that is shared after being reset.
        2. Monitoring of the environment: Environmental monitoring is done with a Geiger-Müller counter, which reacts to the presence of ionizing particles. After a course of inpatient RIT is completed and before the

room is cleaned, the RSO surveys the room, linens, and garbage with the Geiger-Müller counter.

c. Type of radiation emission: A radionuclide, depending on its type, can emit one, two, or three types of emissions (Bruner, Haas, & Gosselin-Acomb, 2005).
    1. Alpha particles: These particles travel at great speed but have poor penetrating ability. Alpha particles cannot penetrate the outermost layers of skin, and they travel a maximum distance of 5 cm. A sheet of paper between the radiation source and the point or a distance of 5 cm between the radiation source and the point will shield the radiation. The skin of an alpha-irradiated patient is adequate to protect others from radiation exposure; in other words, alpha particles are not external hazards. However, contact with an irradiated patient's excreted body fluids may be hazardous.
    2. Beta particles: Beta particles have greater penetration abilities than do alpha particles. Like alpha particles, beta particles are not external hazards. The patient's skin or thick plastic shielding is usually adequate protection from beta particles. Yttrium-90 (such as Zevalin®) emits beta particles. After RIT, the following apply.
        a. The patient's body fluids are temporarily radioactive.
        b. The patient should receive specific discharge instructions to limit family exposure.
    3. Gamma rays
        a. High-energy gamma-emitting radionuclides: Protection from these rays is achieved by maintaining a specific distance from the radioactive source and the point (the distance is specific to the radioisotope used) and using appropriate shielding. Patients receiving this type of radionuclide may have to be in radiation isolation and behind lead shields (Bruner, Haas, & Gosselin-Acomb, 2005).
            i. Iodine-131 emits high-energy beta particles and gamma rays.
            ii. Care should include the following (Bruner, Haas, & Gosselin-Acomb, 2005).
                - Restrict people entering the room during infusion
                - Observe time and distance limitations based on recommendations of the RSO or nuclear pharmacist.
                - Release patient after administration based on specific guidelines that vary by state.
                - Pregnant women and children should avoid contact with the patient.

- Body fluids are radioactive for a period of time depending on the half-life and elimination of the isotope.
- Provide patient-specific discharge instructions to limit family exposure.

b. Low-energy, or weak, gamma-emitting radionuclides: Special precautions usually are not necessary (Bruner, Haas, & Gosselin-Acomb, 2005).

11. Handling a patient's body fluids
    a. After chemotherapy
        1. Institute universal (standard) precautions (double gloves and disposable gown) when handling the blood, emesis, or excreta of a patient who has received chemotherapy within the previous 48 hours. Wear a face shield if splashing is possible (NIOSH, 2004).
        2. For an incontinent child or adult: Clean the patient's skin well with each diaper change. Apply a protective barrier ointment to the skin of the patient's diaper area to decrease the chance of skin irritation from contact with urinary metabolites (Polovich, 2003).
        3. Flush the toilet with the lid down after disposing of excreta from a patient who has received cytotoxic agents within the past 48 hours. There is no research to support the effectiveness of double flushing. Double flushing has been suggested in the literature (Brown et al., 2001; Welch & Silveira, 1997) and may be helpful with low volume per flush toilets (Polovich, 2003).
    b. After RIT (Bruner, Haas, & Gosselin-Acomb, 2005)
        1. Institute universal (standard) precautions as above when handling the patient's body fluids (e.g., sweat, saliva, urine, feces, blood, semen, vaginal fluid). The duration of precautions varies depending on the radionuclide's half-life.
        2. Consult the RSO or nuclear pharmacist.

12. Handling a patient's linens
    a. After chemotherapy (Polovich, 2003)
        1. To the extent possible, preclude the need for laundering linens and clothing by using disposable linens or leakproof pads to contain body fluids.
        2. If body fluids are present, use universal (standard) precautions when handling the linens of a patient who has received chemotherapy within 48 hours.
        3. Handle bed linens and clothing according to the setting.
            a. In the hospital setting
                i. Place linens into a plastic bag.

ii. Prewash linens before they are added to other hospital laundry for a second washing (OSHA, 1995).

b. In the home setting (Polovich, 2003) (see Appendix 3 in the original guideline document)

i. Wearing gloves, place contaminated linens into a washable pillowcase, separate from other items.

ii. Machine wash linens and cloth diapers twice in hot water, with regular detergent, separately from other household items (Gullo, 1995).

iii. Discard disposable diapers with other hazardous wastes by placing them in appropriately labeled plastic bags intended for hazardous waste disposal.

iv. Discard used gloves and gowns in an appropriately labeled hazardous waste container.

b. After RIT (Bruner, Haas, & Gosselin-Acomb, 2005)

1. If body fluids are present, use universal (standard) precautions when handling the linens of a patient who has received RIT.
2. Keep linens in the hospital room until scanned and cleared by the RSO or nuclear pharmacist.

13. Disposal of hazardous drugs and materials contaminated with hazardous drugs

a. In a hospital setting (NIOSH, 2004)

1. Place soft contaminated materials into a sealable, leakproof plastic bag or a rigid cytotoxic waste container marked with a brightly colored label that cites the hazardous nature of the contents.
2. Use puncture-proof containers for sharp or breakable items. Dispose of needles and syringes intact; do not break or recap needles or crush syringes.
3. Seal containers when full.
4. Do not dispose of drug-contaminated items in infectious waste (red) containers. Some facilities autoclave or microwave these materials (NIOSH, 2004).
5. Only housekeeping personnel who have received instruction in safe handling procedures should handle waste containers. These personnel should wear gowns with cuffs and a back closure and two pairs of disposable latex or nitrile gloves.

b. In a home setting (Polovich, 2003) (see Appendix 3 in the original guideline document)

1. Follow all the instructions applicable to a hospital setting except those relating to handling the filled waste container.
2. Designate an area away from children and pets where filled containers can await pickup.

3. Follow county and state regulations regarding the disposal of hazardous wastes.
4. Many agencies that provide the drug(s) will arrange for proper disposal of contaminated equipment.

14. Procedures following acute accidental cytotoxic exposure: Improper technique, faulty equipment, or negligence in BSC operation can lead to exposure (OSHA, 1995).
    a. Cleansing
        1. In the event of skin exposure: Remove any contaminated garments and immediately wash contaminated skin with soap and water. Refer to the MSDS for agent-specific interventions.
        2. In case of eye exposure: Immediately flush the eye with saline solution or water for at least 15 minutes (OSHA, 1995). Then seek emergency treatment. Ideally, each area designated for the handling of cytotoxic agents should contain an eyewash station. An acceptable alternative is sterile saline connected to IV tubing.
    b. Reporting (Polovich, 2003)
        1. In case of employee exposure: Report the exposure to the employee health department or as institutional policy requires.
        2. In case of patient exposure: Report the exposure as institutional policy requires. In addition, inform the patient's healthcare providers.

15. Spill management
    a. Radioactive spills: In case of a spill of radiolabeled antibody or contamination with the radioactive body fluid of a patient recently treated with RIT (Bruner, Haas, & Gosselin-Acomb, 2005)
        1. Restrict access to the area, and contact the RSO immediately. Never try to clean the area or touch the radioactive source. Adhere to the principles of time, distance, and shielding (see section 10 above, Principles of Radiation Precautions).
        2. Follow other applicable Nuclear Regulatory Commission guidelines.
    b. Cytotoxic spills: Spill kits should be available wherever hazardous drugs are stored, transported, prepared, or administered (see Figure 9 in the original guideline document). Everyone who works with hazardous drugs should be trained in spill cleanup. Individuals trained in handling hazardous materials (such as a Hazardous Materials Response Team) should clean up large spills whenever possible (OSHA, Code of federal regulations, Title 29, Labor Subpart: Hazardous materials," 2004). In case of a spill involving a cytotoxic agent, follow these procedures.
        1. Immediately post a sign or signs that warn others of the presence of a hazardous spill. This will prevent others from being exposed.

2. Don two pairs of gloves, a disposable gown, and a face shield.
3. Wear a NIOSH-approved respirator (OSHA, Code of federal regulations, Title 29, Labor Subpart: Personal protection equipment," 2004c).
4. Use appropriate items in the spill control kit to contain the spill.
5. Clean up the spill according to its location and type. Do not use chemical inactivators, with the exception of sodium thiosulfate. (Sodium thiosulfate is used to inactivate mechlorethamine, also known as nitrogen mustard.) Inactivators other than sodium thiosulfate may react with the spilled material to form potentially dangerous by-products (Harrison, 2001).
    a. To clean up a spill on a hard surface ("ASHP technical assistance bulletin," 1990)
        i. Wipe up liquids by using absorbent gauze pads or spill-control pillows. Wipe up solids by using wet absorbent gauze pads.
        ii. Pick up glass fragments by using a small scoop or utility gloves worn over chemotherapy gloves. Place the glass in a puncture-proof container.
        iii. Place puncture-proof container and contaminated materials into a leakproof waste bag. Seal the bag. Place the sealed bag inside another bag, appropriately labeled as hazardous waste. For the moment, leave the outer bag open.
        iv. Clean the spill area thoroughly, from least contaminated to most contaminated areas, using a detergent solution followed by clean water.
        v. Use fresh detergent solution to wash any reusable items used to clean up the spill and items located in the spill area (e.g., a volumetric pump). Use water to rinse the washed items. Repeat the washing and rinsing.
        vi. Remove PPE and place disposable items in the unsealed cytotoxic waste disposal bag.
        vii. Seal the outer cytotoxic waste disposal bag and place it in a puncture-proof container.
        viii. Follow institutional guidelines regarding cleaning or maintenance of equipment.
        ix. Dispose of all material used in the cleanup process according to institutional policy and federal, state, and local laws (OSHA, 1995).
    b. To clean up a spill on a carpeted surface (note that carpet is not recommended in drug administration areas), OSHA (1995) and

American Society of Hospital Pharmacists (1990) recommend the following.

i. Don PPE, including a NIOSH-approved respirator.
ii. Use absorbent powder, not absorbent towels, to absorb the spill.
iii. Use a small vacuum cleaner, reserved for hazardous-drug cleanup only, to remove the powder.
iv. Clean the carpet as usual.
v. Follow guidelines for a spill on a hard surface to clean and dispose of other contaminated items.

c. To clean up a spill in a biological safety cabinet (BSC) ("ASHP technical assistance bulletin," 1990; OSHA, 1995)
   i. If the volume of the spill is <150 ml: Clean up the spill according to the guidelines for a spill on a hard surface.
   ii. If the volume of the spill is >150 ml: Clean up the spill as if it were a spill on a hard surface. Include the drain spillage trough in washing efforts. Then complete the following additional steps.
      - If the spill was not contained in a small area or the drain spillage trough: Wash the affected areas with a cleaning agent designed to remove chemicals from stainless steel.
      - If the spill contaminated the high efficiency particulate air filter: Seal the BSC in plastic and label it as contaminated equipment. Schedule a BSC service technician to change the high efficiency particulate air filter. Ensure that the BSC is not used before the filter is changed.
      - Clean and/or dispose of contaminated items as described in the guidelines for spills on a hard surface.

d. To clean up a spill in the home setting: See Figure 10 in the original guideline document.

6. Report and document the spill according to institutional policy: Each time a spill of more than 5 ml occurs, complete a report about the spill and forward it to those specified by institutional policy (Harrison, 2001). Document the following.
   a. The name of the drug and the approximate volume spilled
   b. How the spill occurred
   c. Spill management procedures followed

d. The names of personnel, patients, and others exposed to the spill
e. A list of personnel notified of the spill

16. Requirements for policies regarding the handling of hazardous drugs: OSHA (Codes of Federal Regulations. Title 29, Labor Subpart: General Definitions, 2004) requires that employers provide a safe or healthful workplace. Employers must implement policies and procedures related to the safe handling of hazardous drugs. Policies should address all aspects of handling these hazardous materials to protect employees, patients, customers, and the environment from exposure. Such policies must (NIOSH, 2004)
    a. Outline procedures to ensure the safe storage, transport, administration, and disposal of hazardous agents.
    b. Describe the procedure for identifying and updating the list of the hazardous drugs used in the facility (NIOSH, 2004).
    c. Require that all employees who handle hazardous drugs wear PPE.
    d. Mandate that hazardous drugs be prepared in a BSC.
    e. Prohibit staff from eating, drinking, smoking, chewing gum, using tobacco, storing food, and applying cosmetics in areas where hazardous drugs are prepared or used.
    f. Mandate training for all employees who prepare, transport, or administer hazardous drugs or care for patients receiving these drugs. Document the training program.
    g. Make documents such as MSDS available to healthcare workers who handle hazardous drugs.
    h. State that spills should be managed according to the institution's hazardous drug spill policy and procedure.
    i. Set forth a plan for medical surveillance of personnel handling hazardous drugs.
    j. Allow employees who are pregnant, actively trying to conceive, or breast-feeding or who have other medical reasons for not being exposed to hazardous drugs to refrain from preparing or administering those agents or caring for patients during their treatment with them upon request. (No information is available regarding the reproductive risks of workers who use currently recommended precautions [OSHA, 1995; Polovich, 2003; Welch & Silveira, 1997].) Alternate duty that does not include hazardous drug preparation or administration must be made available to both men and women involved in planning a pregnancy when requested.
    k. Define quality improvement programs that monitor compliance with safe-handling policies and procedures (Maxson & Wolk, 1998).

B. Treatment schedule
    1. Dosing category
        a. Standard-dose therapy
            1. Standard is the most frequent type of treatment schedule used.

2. A patient may receive lower than standard dose because of
    a. Dose delays: Chemotherapy may be delayed for an additional week because of inadequate neutrophil counts or oral mucositis toxicities.
    b. Reduced dosing: Doses may be reduced by 25%–75% according to platelet levels. A 20% dose reduction can result in about 50% less cure rate (Chu & DeVita, 2001).
    c. Inadvertent miscalculation of dose (Biganzoli & Piccart, 1997).

3. Decreased cytotoxic effect occurs in more than 30% of people receiving standard regimens (Gurney, 2002).
4. Inadequate dosing may be a problem in
    a. The elderly (Hood & Mucenski, 2003; Piccart, Biganzoli, & DiLeo, 2000; Repetto, 2003). Doses in the elderly often are not evidence based (Gillespie, 2001).
    b. People who have curable disease (Felici, Verweij, & Sparreboom, 2002).

b. High-dose therapy
    1. High-dose involves administration of a dose that is potentially sufficient to eradicate the tumor and may cause severe, even lethal, side effects that warrant supportive therapy (e.g., stem cell transplant).
    2. It usually includes an alkylating agent-based regimen such as cyclophosphamide (Vose, 1996).
    3. High-dose therapy usually is used in patients with acute leukemias or aggressive lymphomas (Gurney, 2002).
    4. It includes use of colony-stimulating factors.
    5. One of the most important variables influencing successful stem cell transplant is a patient's enduring response to standard-dose chemotherapy before the high-dose therapy (Philip et al., 1987; Pico et al., 1995; Wahlin, Eriksson, & Huttden, 2004).
    6. Some cancers, and certain chemotherapy regimens, have not involved high enough doses to obtain the best survival response. Standard, but suboptimal, doses may achieve a clinical complete remission, but because the tumor is still present, relapse is almost certain. Dose intensity is beneficial in these situations where standard doses have not been optimal (Biganzoli & Piccart, 1997). However, there seems to be a critical level below which the lack of optimal dosing compromises survival outcome and above which there is little therapeutic benefit and only increased toxicity (Gurney, 2002).
    7. It may require supportive therapy (e.g., colony-stimulating factors, transfusions, antiemetics, analgesia).

8. Hryniuk (1987) criticized the technique of dose intensity, administering smaller doses more frequently, for delivering suboptimal doses and, thus, never exposing the cancer to therapeutic and lethal levels that will eradicate the cancer.

2. Dosing modifications
    a. Dose intensity
        1. Dose intensity provides unit-based measurement to compare efficacies of different chemotherapies with different dosing approaches.
        2. It is measured as milligrams per meter squared per week.
        3. With multiple drug regimens, each drug is compared to standard or relative drug intensity (Chu & DeVita, 2004; Foote, 1998; Gianni & Piccart, 2000; Gradishar, Tallman, & Abrams, 1996; Hryniuk, 1987; Piccart, Biganzoli, & DiLeo, 2000).
    b. Dose density: This is based on dose per source, interval between doses, and/or the total amount of dose given (Biganzoli & Di Leo, 2000; Piccart, Biganzoli, & DiLeo, 2000).
    c. Combined modality therapy
        1. Combined modality is chemotherapy (including biotherapy) administered before (neoadjuvant), after (adjuvant), or concurrently with surgery or radiation therapy (Works, 2000).
        2. An example of chemotherapy and biotherapy, or targeted therapy, is gefitinib and gemcitabine for non-small cell lung cancer, which is in phase III clinical trial.
        3. Chemotherapy may be used as a radiosensitizer that enhances the lethal effects of radiation therapy.
            a. The primary goal is to prevent radiation resistance and enhance local and regional control of disease by eliminating radiation-resistant cancer cells and increasing the oxygen supply to the tumor as it shrinks in response to the chemotherapy (Tortorice, 2000).
            b. An example is carboplatin and radiation for non-small cell lung cancer.
            c. Cisplatin, methotrexate, doxorubicin, vinblastine, etoposide, fluorouracil, actinomycin, and bleomycin are other examples of chemotherapy that have been used in combined modality regimens.
            d. The most frequent toxicities occur in the gastrointestinal (GI) tract, skin and mucosa, and bone marrow.

3. Dose determination
    a. Each method contains variance. To reduce iatrogenic variance and increase accuracy, use a systematic approach that includes the following.

1. Current and accurate (not stated) weights, heights, age, and lab values (e.g., creatinine, aspartate aminotransferase [AST], platelets, absolute neutrophil count [ANC])
2. Multiple checks and balances that include dose verification by at least two healthcare professionals prepared in cancer chemotherapy administration
3. A 5% variance in body surface area (BSA), area under the plasma concentration versus time curve (AUC), and mg per kg dose calculations. Final delivered dose does not vary by more than 5% unless explanations for variations in dosing are included in chemotherapy orders.
4. Standardized and systematic dose calculations and tools to determine these calculations

b. Dosing procedure (Chen et al., 1997; Cotton et al., 2003)
1. Determine accurate method and tools to arrive at BSA (m^2), AUC (using estimated creatinine clearance), mg/kg (weight in kilograms), or other measure.
2. Multiply the value obtained in (1) by the prescribed unit dose according to the reference (e.g., clinical trials protocol information, drug product insert, current drug books and software, evidence-based articles in reputable medical journals) that describes the chemotherapy regimen. This determines patient-specific dose (see Table 10 for examples of how to determine the final dose).
3. Verify safe dose based on a reliable source that lists dose ranges approved for each chemotherapy drug. If the patient is on a research study, clinical trial protocol recommendations supersede all other referenced information. "Safe" doses still can be inaccurate. It is important to verify accurate dosing by examining the source that contains the chemotherapy protocol.

c. Methods
1. Milligrams per kilogram
    a. This method is more commonly used in children younger than one year or weighing less than 10 kg.
    b. BSA estimation based only on weight is being studied in children, especially for infants weighing less than 10 kg (Sharkey et al., 2001).
    c. Many biologic agents use mg/kg dosing, including bevacizumab, epoetin alfa, trastuzumab, and darbepoetin alfa.
2. BSA or m^2
    a. Many methods exist for determining BSA. Mosteller's (1987) formula requires only a pocket calculator with square root function (see Figure 11 in the original guideline document). Many BSA calculators now are available on the Internet.
    b. Use of a nomogram is not recommended because of inaccuracy that can result from copy machine

distortion of the chart and inability to accurately read the BSA value on the chart. Some authors suggested an 8% error rate when using nomograms.

c. Accuracy of BSA has been questioned, citing 5% underestimation (Wang, Moss, & Thisted, 1992) to 40% inaccuracy (Gurney, 2002). Other than AUC or kg/mg for selected drugs, no other standardized and practical approach has been determined.
d. Modifications to final administered dose are based on the variables in Table 11 in the original guideline document. Consider establishing an institutional policy on approach to modifications made to chemotherapy doses.

3. AUC
    a. The Calvert formula is used most frequently for AUC dosing (Calvert et al., 1989).
    b. It is the standard of practice for determining carboplatin dosing only but still contains error variance.
    c. The following information is needed to determine carboplatin dose based on AUC.
        i. Formula used to determine estimated creatinine clearance
        ii. Formula used to determine AUC dose
        iii. Target AUC. This is ordered by the physician and found in the chemotherapy protocol resource. It most often falls between 5 and 7 mg/ml/minute in pretreated patients and is based on research recommendations (Alberts & Dorr, 1998).
        iv. Rationale for changes in recommended dose. Examples of variables that could contribute to alterations in computed dose include platelet level, using combination chemotherapy, abnormally high or low creatinine, obesity, and previous treatment with renal toxic drugs. A pediatric patient would require a modified formula (Marina et al., 1993; Thomas et al., 2000).
    d. Why use AUC for carboplatin dosing? (De Jonge et al., 2002; Donahue et al., 2001; van den Bongard et al., 2000)
        i. 70%-90% of carboplatin is excreted in urine chemically unchanged.
        ii. Renal function, especially glomerular filtration rate (GFR), plays a major role in determining efficacy and toxicities of carboplatin and is a major variable in

determining the dose of carboplatin to administer.

e. Begin by estimating creatinine clearance based on a serum creatinine, unless you have an actual nuclear glomerular filtration rate value. The most commonly used formula is the Cockcroft-Gault (see Figure 12 in the original guideline document). Other formulas also are available, such as the Jelliffe formula (see Figure 13 in the original guideline document).
f. Use the estimated creatinine clearance value obtained from the Cockcroft-Gault formula to complete the Calvert formula. This will determine the final recommended dose of carboplatin to administer to the patient (see Figure 14 in the original guideline document). The 25 is a formula constant that denotes unexcreted drug bound to protein and drug that is secreted by the renal tubules (van Warmerdam, 1997).

C. Pretreatment

Follow institutional guidelines regarding documentation of assessment and provision of care. Appendices 1 and 2 in the original guideline document provide sample flow sheets.

1. Nursing assessment and case review
    a. Patient history
        1. Review recent treatment(s), including surgery, radiation therapy, prior cytotoxic therapy, hormonal therapy, and complementary therapies (e.g., acupuncture, chiropractic, nutritional).
        2. Review and document medical, psychiatric, and nononcologic surgical history.
        3. Document drug, food, and environmental allergies.
        4. Obtain an accurate list of all medications that the patient uses, including prescription, over-the-counter, herbs, and vitamins. More than 40% of the American public use complementary and alternative medicine. Patients may disclose use of these products only when directly questioned in a nonjudgmental fashion (Oliveira, 2001; Reuters Health, 2000).
        5. Age-specific concerns: The elderly often have multiple comorbidities for which they take multiple medications. Be aware of the potential for drug interactions with chemotherapy agents (Hood, 2003).

    b. Signs and symptoms of underlying disease process and any previous treatments
        1. Symptom screening during the pretreatment phase is crucial to successful symptom management.

2. Poorly controlled symptoms impact the quality of life for the patient and can interfere with delivery of chemotherapy and other treatment modalities (Dodd, Miaskowski, & Paul, 2001; Houldin, 2000).

2. Screening tools
    a. Assess performance status by using scales such as the Karnofsky, Zubrod, or Eastern Cooperative Oncology Group (see Table 3 in the original guideline document).
    b. Assess pain using an age-appropriate scale (e.g., numeric 0–10 scale, facial expressions, visual analog).
    c. Assess for fatigue using an appropriate scale, such as the Brief Fatigue Inventory (Mendoza et al., 1999), the Piper Fatigue Scale (Piper et al.,1998), or the Schwartz Cancer Fatigue Scale (Schwartz, 1998).

3. Patient data
    a. Obtain and document the patient's actual height and weight; compare with previous visits.
    b. Compare current and previous lab values. Age-specific concern: Assess for age related changes in pulmonary, renal, and cardiac function in the elderly.
    c. Review diagnoses, tumor type, grade, and staging.
    d. Obtain treatment records from past encounters to determine symptom management strategies that were employed.
    e. Assess cultural and spiritual issues that may affect the treatment plan.
    f. Assess how the patient and family are coping with the cancer experience.
    g. Determine the need for referral to a social worker, spiritual care provider, dietitian, physical therapist, and other member of the multidisciplinary team as needed. Age-specific concerns: When caring for pediatric patients, consult play therapists and child-life specialists. If a school-age youth is going to be out of school for a prolonged time, explore options for continued study available through the appropriate school district (e.g., home study, online programs).

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence supporting the recommendations is cited throughout the body of the original guideline document.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

This guideline will provide the registered nurse with the clinical information necessary to safely prepare, store, transport, handle, administer, dispose of, and assess response to cytotoxic and biotherapeutic agents. In addition, it will prepare the nurse to be able to prevent and manage any adverse reactions, side effects, and toxicities associated with treatments.

POTENTIAL HARMS

Refer to the "Major Recommendations" section and to the original guideline document for discussions of immediate complications of cytotoxic therapy, side effects of cancer therapy, and health and safety risks to healthcare workers who handle cytotoxic agents and biomaterials.

CONTRAINDICATIONS

CONTRAINDICATIONS

- Chlorambucil is contraindicated in patients with seizure history and within one month of radiation and/or cytotoxic therapy.
- Azacitidine is contraindicated in patients with hypersensitivity to azacitidine or mannitol and those with and those with advanced malignant hepatic tumors.
- Capecitabine is contraindicated in patients with known hypersensitivity to 5-fluorouracil (5-FU).
- Fulvestrant is contraindicated in patients with bleeding disorders and in those on anticoagulant therapy.
- Flutamide is contraindicated in severe hepatic impairment.
- Rasburicase is contraindicated in patients with glucose-6-phosphate dehydrogenase (G6PD) deficiency.
- Steroids are often contraindicated for patients receiving biotherapy agents because of their immunosuppressive effects.
- Dexamethasone is contraindicated with most biotherapy agents.
- Refer to Table 21 in the original guideline document for contraindications to common antidiarrheal medications.
- Corrective dental work is contraindicated in patients with therapy-induced neutropenia and thrombocytopenia.
- Swallowing proidone-iodine is contraindicated.
- Increasing fiber in the diet is contraindicated in cases of structural bowel blockage.
- Antihistamines may be contraindicated in certain regimens.
- Treatment with biotherapy (particularly IL-2, interferons) may be contraindicated. in elderly and patients with a psychiatric history.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

The guideline document is published by the Oncology Nursing Society (ONS). ONS neither represents nor guarantees that the practices described herein will, if followed, ensure safe and effective patient care. The recommendations contained in the guideline document reflect ONS´s judgment regarding the state of general knowledge and practice in the field as of the date of publication. The recommendations may not be appropriate for use in all circumstances. Those who use the guideline document should make their own determinations regarding specific safe and appropriate patient-care practices, taking into account the personnel, equipment, and practices available at the hospital or other facility at which they are located. The editors and publisher cannot be held responsible for any liability incurred as a consequence from the use or application of any of the contents of these guidelines. Figures and tables are used as examples only. They are not meant to be all-inclusive, nor do they represent endorsement of any particular institution by ONS. Mention of specific products and opinions related to those products do not indicate or imply endorsement by ONS.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

IMPLEMENTATION TOOLS

Staff Training/Competency Material

For information about availability, see the "Availability of Companion Documents" and "Patient Resources" fields below.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

End of Life Care
Getting Better
Living with Illness
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Oncology Nursing Society (ONS). Chemotherapy and biotherapy guidelines and recommendations for practice. 2nd ed. Pittsburgh (PA): Oncology Nursing Society (ONS); 2005. 246 p. [886 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2001 (revised 2005 May; republished 2005 Dec)

GUIDELINE DEVELOPER(S)

Oncology Nursing Society - Professional Association

SOURCE(S) OF FUNDING

Oncology Nursing Society

GUIDELINE COMMITTEE

Not stated

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Authors: Lois A. Almadrones, RN, MS, FNP, MPA; Nancy Bowles, RN, BSN, OCN, CRNI; Theresa Clark, RN; Cindy Jo Horrell, CRNP, MS, AOCN; Anne M. Ireland, RN, MSN, AOCN; Eileen Duffey Lind, MSN, RN, CPNP, CPON; Rebecca Long, MSN, RN, OCN; Paula M. Muehlbauer, RN, MSN, OCN; MiKaela Olsen, RN, MS, OCN; Maureen H. Quick, RN, MS, OCN; Elizabeth Randall, BSN, RN, BC; Stephanie Shields, PharmD; Tracy Skripac, RN, CNS, MSN, AOCN, CHPN; Michael Steinberg, BA, BS, PharmD, BCOP; Wendy Stiver, RN, BSN, MA, OCN; Cynthia L. Teeple, APRN, BC, MSN, AOCN; Shirley A. Triest-Robertson, RN, PhD, AOCNS; Jennifer S. Webster, MN, MPH, RN, AOCN; Barbara J. Wilson, MS, RN, OCN, AOCN, CS

Field Reviewers: Janice Beschorner, RN, MS, AOCN; Eileen M. Glynn-Tucker, RN, MS, AOCN; Jeanne Held-Warmkessel, MSN, RN, AOCN, APRN-BC; Angela Klimaszewski, MSN, RN; Elizabeth Randall, BSN, RN, BC; Jean Rosiak, RN, BSN, OCN; Gail M. Sulski, RN, MS, FNP, AOCN; Cindy von Hohenleiten, RN, MN; Jan Watkins, RN, MS, OCN

Editors: Martha Polovich, MN, RN, AOCN; Julie M. White, RN, BSN, OCN; Linda O. Kelleher, RN, MS

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Oncology Nursing Society (ONS). Chemotherapy and biotherapy: guidelines and recommendations for practice. Pittsburgh (PA): Oncology Nursing Society (ONS); 2001. 226 p.

GUIDELINE AVAILABILITY

Electronic copies: Not available at this time.

Print copies: Available for purchase from the Oncology Nursing Society, 125 Enterprise Drive, Pittsburgh, PA 15275-1214; telephone, 412-859-6100; fax, 412-921-6565. The ONS Publications Catalog is available online at the Oncology Nursing Society (ONS) Web site.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on May 8, 2003. The information was verified by the guideline developer on May 30, 2003. This summary was updated by ECRI on September 8, 2005 following the U.S. Food and Drug Administration (FDA) advisory on Herceptin (trastuzumab). This summary was updated by ECRI on May 4, 2006. The updated information was verified by the guideline developer on May 24, 2006.

COPYRIGHT STATEMENT

This summary is based on the original guideline, which is copyrighted by the Oncology Nursing Society (ONS).

DISCLAIMER

NGC DISCLAIMER

The National Guideline Clearinghouse™ (NGC) does not develop, produce, approve, or endorse the guidelines represented on this site.

All guidelines summarized by NGC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public or private organizations, other government agencies, health care organizations or plans, and similar entities.

Guidelines represented on the NGC Web site are submitted by guideline developers, and are screened solely to determine that they meet the NGC Inclusion Criteria which may be found at http://www.guideline.gov/about/inclusion.aspx.

NGC, AHRQ, and its contractor ECRI make no warranties concerning the content or clinical efficacy or effectiveness of the clinical practice guidelines and related materials represented on this site. Moreover, the views and opinions of developers or authors of guidelines represented on this site do not necessarily state or reflect those of NGC, AHRQ, or its contractor ECRI, and inclusion or hosting of guidelines in NGC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding guideline content are directed to contact the guideline developer.

© 1998-2006 National Guideline Clearinghouse

Date Modified: 9/25/2006